SELF-ADJUSTING MECHANISM FOR A THERMOSTAT RESPONSIVE TO HUMIDITY

Priority is hereby claimed of provisional patent application ser. no. 60/447,349 filed February 13 , 2003.

Background and Summary of the Invention

The present invention is directed to the field of heating, ventilating, and air conditioning (HVAC). More particularly, the present invention is directed to a self-adjusting mechanism for a thermostat which senses humidity and adjusts the temperature within an area based on comfort considerations.

It is well known that the humidity within a room or other space subject to HVAC, is a factor in determining personal comfort within that space. When the humidity is higher, our body's "comfort sensor" tells us it is comfortably warm even if it is actually several degrees cooler than it might be with drier air. Similarly, in the summertime, drier air seems cooler even when several degrees warmer than moist air. This impacts not only our physical comfort, but our heating/cooling costs, as well. If the thermostat recognized a change in humidity which would permit the temperature to be reduced 3-4°, over the course of a heating/cooling season, significant savings could be realized.

The COMFORTSTAT of the present invention comprises a self-adjusting mechanism for a thermostat for modifying its setting as a result of humidity differences to adjust a temperature in a HVAC controlled space and includes a first mounting plate attachable to a wall; a second enhanced mounting plate to which a conventional mercury bulb thermostat is attached, said second mounting plate being mounted for limited rotation relative to said first mounting plate to adjust a relative

rotational position of said second mounting plate; means to sense a humidity in the HVAC controlled space and adjust said temperature setting of the thermostat, lower for more humid air and warmer for drier air. The means to sense and adjust comprises a spring, preferably, a composite coil spring which expands and contracts differentially responsive to changes in humidity.

The self-adjusting mechanism includes a hub integrally formed with the first mounting plate, and the spring is coiled thereabout. The hub has a slot which receives a first end of said spring. The second end of said spring is attached to a second enhanced mounting plate which has a thermostat with a conventional mercury bulb mounted thereon, the second mounting plate having a central collar which rotates on the hub. A level is mounted on the first mounting plate to facilitate proper installation of the thermostat adjusting mechanism.

Various other features, advantages and characteristics of the present invention will become apparent to one of ordinary skill in the art after a reading of the following specification.

Brief Description of the Drawings

The preferred embodiment(s) of the present invention is/are described in conjunction with the associated drawings in which like features are indicated with like reference numerals and in which

Fig. 1 is a front perspective view of a first embodiment of a first wall mounting plate for the self-adjusting mechanism for use with a thermostat of the present invention;

Fig. 2 is a side view of the first wall mounting plate shown in Fig. 1;

Fig. 3 is a front perspective view of the self-adjusting mechanism with the second enhanced mounting plate in place;

Fig. 4 is a back view of the second enhanced mounting plate;

Fig. 5 is a cross-sectional side view of the second enhanced mounting plate;

Fig. 6A is a front view of the adjusting spring;

Fig. 6B is a side view of the adjusting spring; and,

Fig. 7 is a schematic depiction of a mercury bulb switch as used with the self-adjusting mechanism of the present invention.

Detailed Description of Preferred Embodiment(s)

The self-adjusting mechanism of the present invention is shown in **Fig. 3** generally at **20**. It will be understood that the self-adjusting mechanism **20** of the present invention may be utilized with any conventional thermostat using a mercury bulb switch or its equivalent. The self-adjusting mechanism **20** comprises a first mounting plate **22** (**Figs. 1** and **2**) and a second enhanced mounting plate **32**. First mounting plate **22** has four slots **24** for securing first mounting plate **22** to a wall over the wires for controlling the HVAC. A large diameter hole **26** is provided to permit the wires to be connected to the thermostat (not shown). A central axle **28** is formed protruding out from the face **27** of first mounting plate **22** with a slot **29** for receiving a first end **42** of spring **40** and an axial threaded hole **31**. As best seen in **Figs. 6A** and **6B**, spring **40** is a bi-metallic coil spring which lengthens and shortens responsive to changes in the ambient humidity. First end **42** of spring **40** is received in slot **29**, the body of the spring is coiled about axle **28**. A level **30** is provided on the front face **27** of first mounting plate **22** to ensure proper positioning of the plate **22** on the wall. Since tilting of the mercury bulbs **60a** and **60b** (**Fig.** 7) affects the temperature setting for the HVAC, it is desirable that there be no inadvertent tilting when installing the self-adjusting mechanism **20**.

Second enhanced mounting plate **32** has four slots **34** to which a conventional mercury bulb switch thermostat can be fastened. A large diameter hole **36** which is generally aligned with hole **26** is provided to permit the wires to be connected to the thermostat. Second mounting plate **32** has an integral collar **38** with an internal diameter adequate to accommodate axle **28** and spring **40**. Collar **38** has a slot **39** which receives second end **44** of spring **40** and a peripheral skirt **37** to enclose the spring **40**. A small diameter hole **41** which is aligned with hole **31** in axle **28** to permit a screw **43** to attach second enhanced mounting plate **32** to first mounting plate **22**.

It will be understood from viewing **Fig. 7**, that the tilting of mercury bulbs **60a**, **60b** control the furnace and air conditioning, respectively. Where air conditioning is absent, typically, a thermostat will be installed in which bulb **60b** is also lacking. As depicted in **Fig. 7**, bulb **60b** is operational controlling the air conditioner. When dry air is present, spring **40** will cause second mounting plate **32** and the thermostat connected thereto, to be rotated in the direction of arrow **A** a few degrees resulting in a raising of the temperature by say, 4°. Since our body's internal comfort sensor tells us that dry air is cooler, a setting of 72° will feel like 68°. When the humidity increases, the moist air will result in spring **40** rotating second mounting plate **32** and attached thermostat in the direction of arrow **B** back toward the actual setting on the thermostat. This is the mode of operation regardless of whether the HVAC is in the heating or cooling mode. Obviously, the use of humidifiers in the winter and de-humidifiers in the summer will enhance the energy savings possible wit the self-adjusting mechanism of the present invention.

Various changes, alternatives and modifications will become apparent to one of ordinary skill in the art following a reading of the foregoing specification. It is intended that any such changes, alternatives and modifications as fall within the scope of the appended claims be considered part of the present invention.